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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
Animal Husbandry Research Division
Beltsville, Maryland

DIETS FOR REPLACEMENT, LAYING, AND BREEDING CHICKENS

A good poultry diet is any combination of feedstuffs that is palatable and satisfies requirements for energy, protein (amino acids), minerals, and vitamins in proper balance for optimum performance. Since many combinations of feedstuffs will meet these requirements, it is not possible to designate any particular combination as being the best diet. This is also true from an economic standpoint. Assuming any combination of ingredients selected is nutritionally adequate, the choice of the ingredient will be influenced by availability and price, which in turn, may be affected by geographical location or season.

The several sample diets for replacement pullets, layers, and breeders contain the commonly used feedstuffs and are formulated to permit flexibility in choice of basic ingredients (energy and protein sources) while maintaining approximately the same nutritive content. Although they furnish the nutritive requirements recommended by the National Research Council, no individual diet should be considered optimum for all conditions in all locations. Some of the diets may be minimum in energy, especially for colder climates. If a higher energy level is desired, stabilized fat may be added at the expense of grain. Feathermeal or poultry byproduct meal may be substituted for as much as 5 percent of other protein concentrates if it is economically favorable.

Although the efficiency of a diet is basically dependent on its nutritive balance, it can also be influenced by breed or strain of chickens, environment, management, and disease level.

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CURRENT SERIAL RECORDS

Table 1.--All-mash chick-starter diets

Ingredient	No. 1	No. 2	No.3	No.4	No.5	No.6
	Percent	Percent	Percent	Percent	Percent	Percent
Ground yellow corn	25.1	25.1	25.1	25.1	25.1	25.1
Pulverized oats or ground wheat. .	10.0	--	10.0	--	10.0	--
Ground corn, wheat, barley, or grain sorghum	16.4	10.4	17.6	12.6	18.5	11.5
Wheat middlings	--	10.0	--	10.0	--	10.0
Wheat bran	--	10.0	--	10.0	--	10.0
Alfalfa meal	5.0	5.0	5.0	5.0	5.0	5.0
Soybean meal	23.0	19.0	20.0	16.0	20.0	18.0
Cottonseed meal, peanut meal, corn gluten meal, or soybean meal . .	10.0	10.0	10.0	10.0	10.0	10.0
Fishmeal	2.0	2.0	--	--	1.0	1.0
Meatmeal	--	--	4.0	4.0	2.0	2.0
Distiller's dried grains with solubles (corn).	5.0	5.0	5.0	4.0	5.0	4.0
Steamed bonemeal, defluorinated superphosphate, or dicalcium phosphate	1.7	1.7	1.5	1.5	1.6	1.6
Ground limestone or oystershell. .	1.0	1.0	1.0	1.0	1.0	1.0
Salt	0.5	0.5	0.5	0.5	0.5	0.5
Methionine	0.05	0.05	0.05	0.05	0.05	0.05
Starter-grower vitamin premix ^{1/} . .	0.25	0.25	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00	100.00	100.00

Additives

Trace mineral supplement	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>
Coccidiostat	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>
Antioxidant	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>

^{1/} One pound of starter-grower vitamin premix contains: 800,000 USP units of vitamin A; 200,000 IC units vitamin D₃; 200 IU vitamin E; 1.6 mg. vitamin B₁₂; 800 mg. riboflavin; 4,000 mg. niacin; 1,000 mg. d-pantothenic acid; 50,000 mg. choline; 400 mg. menadione sodium bisulfite complex; 40 mg. folic acid; 1 gm. antibiotic.

^{2/} Add 1/2 lb. supplement per ton of feed. Minimum percentages of minerals in the supplement are: 24% manganese, 18% zinc, 8% iron, 1% copper, 0.5% iodine, 0.2% cobalt.

^{3/} To be fed at level recommended by manufacturer.

Table 2.--All-mash chick grower diets

Ingredient	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
	Percent	Percent	Percent	Percent	Percent	Percent
Ground yellow corn	25.1	25.1	25.1	25.1	25.1	25.1
Ground oats or wheat	10.0	--	10.0	--	10.0	--
Ground corn, wheat, barley, or grain sorghum	32.6	21.6	34.6	23.6	38.1	28.1
Wheat middlings	--	15.0	--	15.0	--	15.0
Wheat bran	--	10.0	--	10.0	--	10.0
Alfalfa meal	5.0	5.0	5.0	5.0	5.0	5.0
Soybean meal	16.0	12.0	12.0	8.0	4.0	4.0
Cottonseed meal, peanut meal, corn gluten meal, or soybean meal	5.0	5.0	5.0	5.0	5.0	--
Meatmeal or fishmeal	--	--	3.0	3.0	9.0	9.0
Distiller's dried grains with solubles (corn)	2.0	2.0	2.0	2.0	2.0	2.0
Steamed bonemeal, defluorinated superphosphate or dicalcium phosphate	2.5	2.5	1.5	1.5	--	--
Ground limestone or oystershell	1.0	1.0	1.0	1.0	1.0	1.0
Salt	0.5	0.5	0.5	0.5	0.5	0.5
Methionine	0.05	0.05	0.05	0.05	0.05	0.05
Starter-grower vitamin premix ^{1/}	0.25	0.25	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00	100.00	100.00
Additives						
Trace mineral supplement	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>
Antioxidant	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>

See footnotes to table 1.

Table 3.--Chick grower mashes with which an equal weight of grain is to be fed.

Ingredient	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
	Percent	Percent	Percent	Percent	Percent	Percent
Ground yellow corn	25.2	24.0	25.2	26.0	25.2	29.0
Ground oats or wheat	10.0	--	10.0	--	10.0	--
Ground corn, wheat, barley, or grain sorghum	8.65	--	11.15	--	14.15	--
Wheat middlings	--	14.35	--	14.35	--	14.35
Wheat bran	--	10.0	--	10.0	--	10.0
Alfalfa meal	5.0	5.0	5.0	5.0	5.0	5.0
Soybean meal	27.0	23.0	21.0	17.0	14.0	10.0
Cottonseed meal, peanut meal, corn gluten meal or soybean meal . . .	10.0	10.0	10.0	10.0	10.0	10.0
Meatmeal or fishmeal	--	--	5.0	5.0	10.0	10.0
Distiller's dried grains with solubles (corn)	6.0	6.0	6.0	6.0	6.0	6.0
Steamed bonemeal, defluorinated superphosphate, or dicalcium phosphate	4.5	4.0	3.0	3.0	2.0	2.0
Ground limestone or oystershell. .	2.0	2.0	2.0	2.0	2.0	2.0
Salt	1.0	1.0	1.0	1.0	1.0	1.0
Methionine	0.10	0.10	0.10	0.10	0.10	0.10
Starter-grower vitamin premix <u>1</u> /.	0.5	0.5	0.5	0.5	0.5	0.5
Trace mineral supplement <u>2</u> /.	0.05	0.05	0.05	0.05	0.05	0.05
Total.	100.00	100.00	100.00	100.00	100.00	100.00
Additives						
Antioxidant	<u>3</u> /	<u>3</u> /	<u>3</u> /	<u>3</u> /	<u>3</u> /	<u>3</u> /

See footnotes to table 1.

Table 4.--All-mash layer diets

Ingredient	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
	Percent	Percent	Percent	Percent	Percent	Percent
Ground yellow corn	22.0	21.3	22.3	21.3	21.9	21.4
Ground oats or wheat	10.0	--	10.0	--	10.0	--
Ground corn, wheat, barley, or grain sorghum	30.95	19.95	33.45	22.45	33.85	22.35
Wheat middlings	--	15.0	--	15.0	--	15.0
Wheat bran	--	10.0	--	10.0	--	10.0
Alfalfa meal	5.0	5.0	5.0	5.0	--	--
Soybean meal	15.0	11.0	12.0	8.0	13.0	10.0
Peanut meal, corn gluten meal, or soybean meal.	5.0	5.0	5.0	5.0	5.0	5.0
Meatmeal or fishmeal	--	--	2.0	2.0	2.0	2.0
Distiller's dried grains with solubles (corn)	2.0	2.0	1.0	1.0	4.0	4.0
Steamed bonemeal, defluorinated superphosphate, or dicalcium phosphate	3.0	2.0	2.5	1.5	2.5	1.5
Ground limestone or oystershell	6.0	8.0	6.0	8.0	7.0	8.0
Salt	0.5	0.5	0.5	0.5	0.5	0.5
Layer vitamin premix <u>1/</u>	0.25	0.25	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00	100.00	100.00
Additives						
Trace mineral supplement	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>
Antioxidant	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>

1/ One pound of layer vitamin premix contains: 1,200,000 USP units vitamin A; 300,000 IC units vitamin D₃; 400 I units vitamin E; 400 mg. riboflavin; 2,000 mg. niacin; 400 mg. d-pantothenic acid; 60,000 mg. choline; 0.8 mg. vitamin B₁₂; 200 mg. menadione sodium bisulfite complex; 30 mg. folic acid.

2/ Add 1/2 lb. supplement per ton of feed. Minimum percentages of minerals in the supplement are: 24% manganese, 18% zinc, 8% iron, 1% copper, 0.5% iodine, 0.2% cobalt.

3/ To be fed at level recommended by manufacturer.

Table 5.--Layer mash^{1/}es with which an equal weight of grain is to be fed

Ingredient	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
	Percent	Percent	Percent	Percent	Percent	Percent
Ground yellow corn	23.0	18.0	23.0	21.0	23.3	21.0
Ground oats or wheat	10.0	--	10.0	--	10.0	--
Ground corn, wheat, barley, or grain sorghum	4.45	---	8.45	--	9.15	--
Wheat middlings	--	14.45	--	14.45	--	14.45
Wheat bran	--	10.0	--	10.0	--	10.0
Alfalfa meal	5.0	5.0	5.0	5.0	--	--
Soybean meal	30.0	26.0	24.0	20.0	25.0	22.0
Peanut meal, corn gluten meal or soybean meal	10.0	10.0	10.0	10.0	10.0	10.0
Meatmeal or fishmeal	--	--	4.0	4.0	4.0	4.0
Distiller's dried grains with solubles (corn).	5.0	4.0	4.0	4.0	7.0	6.0
Steamed bonemeal, defluorinated superphosphate, or dicalcium phosphate	6.0	5.0	5.0	4.0	5.0	4.0
Ground limestone or oystershell.	5.0	6.0	5.0	6.0	5.0	7.0
Salt	1.0	1.0	1.0	1.0	1.0	1.0
Layer vitamin premix <u>2/</u>	0.5	0.5	0.5	0.5	0.5	0.5
Trace mineral supplement <u>3/</u>	0.05	0.05	0.05	0.05	0.05	0.05
Total	100.00	100.00	100.00	100.00	100.00	100.00
Additives						
Antioxidant	<u>4/</u>	<u>4/</u>	<u>4/</u>	<u>4/</u>	<u>4/</u>	<u>4/</u>

1/ When these mash^{1/}es are fed, limestone or oystershell should be supplied in hoppers.

2/ See footnote 1 to table 4.

3/ See footnote 2 to table 4.

4/ To be fed at level recommended by manufacturer.

Table 6.--All-mash breeder diets

Ingredient	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
	Percent	Percent	Percent	Percent	Percent	Percent
Ground yellow corn	22.3	21.8	22.8	21.8	22.3	21.8
Ground oats or wheat	10.0	--	10.0	--	10.0	--
Ground corn, wheat, barley, or grain sorghum.	28.75	18.25	32.45	23.45	29.35	20.85
Wheat middlings	--	15.0	--	15.0	--	15.0
Wheat bran	--	10.0	--	10.0	--	10.0
Alfalfa meal	5.0	5.0	5.0	5.0	5.0	5.0
Soybean meal	12.0	8.0	5.0	4.0	11.0	11.0
Peanut meal, corn gluten meal or soybean meal	5.0	5.0	4.0	--	5.0	--
Fishmeal	2.0	2.0	4.0	4.0	1.0	1.0
Meatmeal	--	--	4.0	4.0	2.0	2.0
Distiller's dried grains with solubles (corn).	5.0	5.0	5.0	4.0	5.0	4.0
Steamed bonemeal, defluorinated superphosphate, or dicalcium phosphate	3.2	2.2	2.0	1.0	2.6	1.6
Ground limestone or oystershell. .	6.0	7.0	5.0	7.0	6.0	7.0
Salt	0.5	0.5	0.5	0.5	0.5	0.5
Breeder vitamin premix <u>1/</u>	0.25	0.25	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00	100.00	100.00
Additives						
Trace mineral supplement	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>
Antioxidant	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>

1/ One pound of breeder vitamin premix contains: 1,600,000 USP units vitamin A; 300,000 IC units vitamin D₃; 800 IU vitamin E; 1.2 mg. vitamin B₁₂; 600 mg. riboflavin; 2,000 mg. niacin; 800 mg. d-pantothenic acid; 60,000 mg. choline; 400 mg. menadione sodium bisulfite complex; 60 mg. folic acid.

2/ Add 1/2 lb. supplement per ton of feed. Minimum percentages of minerals in the supplement are: 24% manganese, 18% zinc, 8% iron, 1% copper, 0.5% iodine, 0.2% cobalt.

3/ To be fed at level recommended by manufacturer.

Table 7.--Breeder mashes with which an equal weight of grain is to be fed^{1/}

Ingredient	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
	Percent	Percent	Percent	Percent	Percent	Percent
Ground yellow corn	23.45	13.45	23.45	19.95	25.25	15.25
Ground oats or wheat	10.0	--	10.0	--	10.0	--
Ground corn, wheat, barley, or grain sorghum	--	--	8.5	--	--	--
Wheat middlings	--	15.0	--	15.0	--	15.0
Wheat bran	--	10.0	--	10.0	--	10.0
Alfalfa meal	5.0	5.0	5.0	5.0	5.0	5.0
Soybean meal	24.0	20.0	10.0	10.0	22.0	18.0
Peanut meal, corn gluten meal, or soybean meal	10.0	10.0	8.0	3.0	10.0	10.0
Fishmeal	4.0	4.0	8.0	8.0	2.0	2.0
Meatmeal	--	--	8.0	8.0	4.0	4.0
Distiller's dried grains with solubles (corn)	12.0	11.0	11.0	11.0	11.0	10.0
Steamed bonemeal, defluorinated superphosphate, or dicalcium phosphate.	6.0	4.0	3.5	2.5	5.2	4.2
Ground limestone or oystershell. .	4.0	6.0	3.0	5.0	4.0	5.0
Salt	1.0	1.0	1.0	1.0	1.0	1.0
Breeder vitamin premix ^{2/}	0.5	0.5	0.5	0.5	0.5	0.5
Trace mineral supplement ^{3/}	0.05	0.05	0.05	0.05	0.05	0.05
Total	100.00	100.00	100.00	100.00	100.00	100.00
Additives						
Antioxidant	<u>4/</u>	<u>4/</u>	<u>4/</u>	<u>4/</u>	<u>4/</u>	<u>4/</u>

^{1/} When these mashes are fed, limestone or oystershell should be supplied in hoppers.

^{2/} See footnote 1 to table 6.

^{3/} See footnote 2 to table 6.

^{4/} See footnote 3 to table 6.

Table 8.--Grain mixtures to be fed with an equal ~~weight~~ ^{weight} of chick grower, layer and breeder mashes.

Ingredient	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Yellow corn <u>1</u> / _.	50	33.4	33.4	25	50	--
Wheat	50	33.3	33.3	25	--	50
Oats	--	33.3	--	25	25	25
Barley	--	--	33.3	25	25	25

1/ Cracked corn for chickens less than 12 weeks old; whole corn for older birds.

